

NOTES ON THE MACTRAS OF THE WEST COAST

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The Mactras of the Pacific Coast of North America have always been a difficult group to collectors and students. Almost all the species are known to have a very wide range but as they are seldom found above low-tide line and the thin, brittle shells do not last long when washed ashore, but few good specimens are to be seen in the collections. Even now some of the species are very imperfectly known and there has been much confusion in the application of the names given by the early writers whose meager descriptions were based on poor material.

The literature on the group is not extensive in the works commonly quoted. Gray, in the Mag. Nat. Hist., 1837, described *Mactra exoleta* from the Gulf of California. In the same year Conrad in the Journ. Acad. Nat. Sci., Phila., vol. 7, described *Mactra planulata*, *Mactra californica* and *Cryptodon nuttallii* from shells collected by Nuttall on "muddy marshes bare at low tide" at Santa Barbara. Three species were described by Gould, *Mactra falcata* from Puget Sound in the Proc. Boston Soc. Nat. Hist. for 1850 and *Mactra nasuta* from San Pedro and *Lutraria undulata* from La Paz in the Proceedings for 1851. Gould in his Otia, p. 210, says of *nasuta* Gld., "This species agrees so nearly with *M. falcata* Gld., that until a direct comparison is made it may be considered synonymous." Carpenter, in his review of these different species (Report of 1863, p. 613) says: "Conrad's types being lost, and his species imperfectly described from very young specimens, a difficulty attends their identification, Dr. Cooper found very large valves (resembling *Schizothaerus*) in abundance, but much deformed by the entrance of sand, and apparently killed by the fresh waters of a great flood. The large shells belong to two very distinct species, which are probably those of Conrad; among the small shells is perhaps a third, which may be Dr. Gould's suppressed *nasuta*." Carpenter's application of the earlier names was unfortunate and resulted in much of the later confusion, particularly as seen in the labels in the older collections.

Conrad in the Amer. Journ. Conch., vol. 3, p. 193 (1867) described *Maetra dolabrijformis* and *Maetra catilliformis* from Panama. Both of these species are now also credited to California waters. Dr. Dall in the NAUTILUS, vols. 7 and 8 (1894), redescribed several of the species and added *Maetra hemphilli* from San Diego. In the same connection he suggested the name of *Maetra alaskana* for the Alaskan shell previously referred to *Maetra fulcata* Gld. The next work on the group appears in a review of the nomenclature of the Family Macrtridae by Dr. Dall published in the Trans. Wagner Inst. Sci., vol. 3, part 4 (1898), where these various species are listed under genera, subgenera and sections with a number of changes from the previously used arrangement. Finally in Bull. Dept. Geol., Univ. of Cal., vol. 9 (1916), Earl L. Packard reviewed all the West Coast species, both living and fossil. The results of this last work does not appear in the list of West Coast Shells in Bulletin 112 of the United States National Museum.

We now have the following species recognized from the West Coast whose ranges are reported to reach as far north as San Diego.

ANATINA UNDULATA Gould, 1851.

This is the *Lutraria undulata* of Gould, the *Raeta undulata* of Carpenter, and the *Labiosa undulata* of Arnold and Keep. The range is given by Dall as San Pedro to Panama and it is fully described in Arnold's Paleontology of San Pedro, p. 177. It is a southern shell of which a few valves have been found washed up on Southern California beaches and it is easily recognized by the "concentrically undulated" surface.

MAETRA (MACTROTOMA) CALIFORNICA Conrad, 1837.

This shell is fully described by Packard and Arnold as well as by Dall in the Trans. Wagner Inst. of Sci., vol. 3, part 4, p. 876. It is not the *Standella californica* of Carpenter or the *Maetra californica* of Cooper but seems to be in part at least the *Standella nasuta* of Carpenter. Dall gives the range as Neah Bay to San Diego but Packard gives *Maetra angusta* Desh. as a synonym and as this was a Panama shell the range can be

greatly extended. The species is not uncommon in Southern California and living specimens are sometimes found on the mud flats at low tide. It is the smallest of the Coast species, an inch and a half or less in length and according to Arnold is distinguished by its thicker shell, nearly central beaks and more obtusely rounded anterior end.

MACTRA (MACTROTOMA) DOLABRIFORMIS Conrad, 1867.

This species was redescribed by Dall in the NAUTILUS, vol. 7, p. 138, and the description is copied in Orcutt's Molluscan World, No. 1627. Dall gives the range as from Lobitas, California, to Topolabampo, Mexico, but Conrad's type is given as from Panama. It is a rare species of which a few specimens have been dredged in Southern California waters. The shell is much compressed, resembling *Spisula falcata* Gld., but with more central beaks, more elongated shape, and larger, the adult three and a half to four inches in length.

MACTRA (MACTROTOMA) NASUTA Gould, 1851.

There has been a great deal of difficulty in fixing Gould's shell. He gives the localities in "Otia" as San Pedro and La Paz. The shells to which Carpenter, Cooper, Keep, and others applied the name are now considered to belong to other species. Dall gives the range as San Diego, West Columbia, and Oldroyd has recently, NAUTILUS, vol. 31, p. 97, reported the species from Puget Sound. Packard in his paper, p. 278, lists the shell and gives as synonyms *M. californica* Desh., *M. fragilis* Cpr., and *M. deshayesii* Conr., all of which were from the Gulf of California. Packard says of the shell, "The lack of sulcate beaks, the pronounced gape, the more ventricose form, besides several details of hinge, will serve to separate this species from *M. californica* Conrad with which it is often associated."

MACTRA (MACTRELLA) EXOLETA Gray, 1837.

This is the *Mactra exoleta* of Gray, Carpenter, and Arnold and the *Mactra ventricosa* of Gould and C. B. Adams. The range is given by Packard as San Diego to Panama. There may be some question as to the accuracy of the San Diego record for

the living shell though it is well authenticated from there as a Pleistocene fossil. Arnold gives a full description, p. 175, and says that it is easily distinguished by "the sharply angular trigonal shape, great convexity, elevated umbo, and sharp sub-marginal posterior ridge."

SPISULA (HEMIMACTRA) VOYI Gabb, 1866.

While this species was first described from a fossil by Gabb in his Pal. Cal. vol. 2, p. 24, Packard states, p. 283, that it is represented by a living form in Dall's *S. (polynyma* Stimpson, var.) *alaskana*. This synonymy would include in part the *Mactra falcata* of authors. Dall gives the range for the living shell as Arctic Ocean to Puget Sound and he described it in NAUTILUS, vol. 7, p. 138, and vol. 8, p. 40.

SPISULA (HEMIMACTRA) CATILLIFORMIS Conrad, 1867.

This species was redescribed by Dall in the NAUTILUS, vol. 7, p. 137, and the description is copied in Orcutt's Molluscan World, No. 1625. It is the *Standella californica* of Carpenter and the *Mactra californica* and *Mactra planulata* of Cooper. The shell is well figured in Keep. The large, thin valves, four inches or more in length, are not infrequently washed up on the California beaches during storms. Arnold says of it, "distinguished by its large size, broad, almost oval outline, prominent cartilage pit, long depressed area in front of the umbo, and nearly equally rounded ends." Dall gives the range as Neah Bay to San Diego but Conrad in his original description states "Inhabits Panama."

SPISULA (HEMIMACTRA) HEMPHILLI Dall, 1894.

This species was described from San Diego by Dall in the NAUTILUS, Vol. 7, p. 137, and the description is copied in Orcutt's Molluscan World, No. 1626. The range is given by Dall as San Pedro to San Diego. It is the largest of the Coast species, reaching a length of six inches, and according to Packard is distinguished from *catilliformis* by the more elongated shape, longer laminæ, and more oblique pallial sinus.

SPISULA (SYMMORPHOMACTRA) FALCATA Gould, 1850.

Dall in the Trans. Wagner Inst. Sci., vol. 3, part 4, gives this species as the type of the subgenus *Symmorphomactra*, though in the later Bulletin 112 of the United States National Museum he lists it with the Hemimactras. Carpenter and Cooper included in the species shells which are now considered to belong to other species and Cooper considered *M. nasuta* Gld. a synonym. It is a rather small shell, about two inches in length, and is sometimes found at low tide near the entrances to the California bays. The range is given by Dall as Puget Sound to Coronado Islands. The species is described by Arnold, p. 176, who states, "distinguished from the other species by narrower, more acutely rounded anterior end, and interior radiating ridges."

SPISULA (SYMMORPHOMACTRA) PLANULATA Conrad, 1837.

This is a little known species. It is the *Spisula planulata* of Dall in the NAUTILUS, vol. 8, p. 40, but not the *Standilla planulata* of Carpenter or the *Mactra planulata* of Gabb, Cooper or Stearns. Packard in his paper, p. 293, describes the species and states that it is of the general size and shape of *S. falcata* Gld. but flatter and more inequilateral. Dall gives the range as Monterey to Cape San Lucas.

SCHIZOTHAERUS NUTTALLII Conrad, 1837.

This the *Cryptodon nuttallii* of Conrad, the *Tresus maximus* of Middendorf and Gray, and the *Lutraria capax* of Gould. It is a well-known Coast shell, ranging from Wrangell, Alaska, to San Diego, and has been fully described many times.

The synonymy and localities listed would give all these species a very great range and raises a question either as to the accuracy of the type localities or as to the correctness of applying the names to the California shells. In spite of the fact that five of the species appear in the California lists as ranging to Panama none of them appear in Zetek's recent list of Panama shells. Until more is known of the off-shore fauna of the West Coast of Mexico and Central America it will be very difficult to answer these questions.